

Cuttings Description

Corehole #5

615' FSL x 1295' FEL
Sec.22, T6S, R97W
Garfield County, Colorado

Ground Elev. 8528'
Kelly Bushing 8538'

CH #5

From	To	Description
0'	10'	Missing.
10'	15'	Siltstone, light brown, calcareous, 100%.
15'	20'	As above.
20'	25'	As above.
25'	30'	As above.
30'	35'	As above.
35'	40'	As above.
40'	45'	As above.
45'	50'	Missing.
50'	55'	As above.
55'	60'	As above.
60'	65'	As above.
65'	70'	Siltstone, medium brown, dark inclusions, 100%.
70'	75'	Missing.
75'	80'	Siltstone, medium brown 80%, mudstone, gray, 20%.
80'	85'	Missing.
95'	90'	Siltstone, brown, 60%, sandstone, black inclusions, 40%.
90'	95'	Siltstone, brown, 60%, sandstone, brown, 30%, siltstone, gray, 10%.
95'	100'	As above.
100'	105'	Siltstone, light brown, 40%, siltstone, dark gray brown, 40%, sandstone, light brown, 20%.
105'	110'	Missing.
110'	115'	Contaminated with casing cement.
115'	120'	Missing.

From	To	Description
120'	125'	Siltstone, light brown, 60%, mudstone, gray brown, 40%.
125'	130'	Siltstone, gray, 60%, siltstone, brown, 40%.
130'	135'	As above.
135'	140'	Missing.
140'	145'	Bad sample, contaminated with casing cement.
145'	150'	As above.
150'	155'	Missing.
155'	160'	As above.
160'	165'	As above.
165'	170'	As above.
170'	175'	Siltstone, gray, black carbonaceous material, 100%.
175'	180'	As above.
180'	185'	As above.
185'	190'	As above.
190'	195'	As above.
195'	200'	As above.
200'	205'	As above.
205'	210'	As above.
210'	215'	As above.
215'	220'	Siltstone, greenish gray, 100%.
220'	225'	As above.
225'	230'	As above.
230'	235'	Siltstone, gray to brown, 100%.
235'	240'	As above.
240'	245'	As above.

From	To	Description
245'	250'	As above.
250'	255'	As above.
255'	260'	Siltstone, gray brown, fine black inclusions, 100%.
260'	265'	As above.
265'	270'	As above.
270'	275'	As above.
275'	280'	As above.
280'	285'	Siltstone, gray brown, black inclusions, 100%.
285'	290'	As above.
290'	295'	As above.
295'	300'	As above.
300'	305'	As above.
305'	310'	Siltstone, light green brown, 60%, oil shale, dark brown, slightly varved, calcareous, 40%.
310'	315'	Siltstone, light green brown, 30%, marlstone, light green brown, 70%.
315'	320'	Marlstone, light green, 80%, siltstone, light gray, 20%.
320'	325'	Siltstone, light green brown, 100%.
325'	330'	Siltstone, light brown, 50%, oil shale, dark brown, platy, calcareous, 50%.
330'	335'	Oil shale, dark brown, slightly varved, calcareous, 70%, siltstone, light brown, 30%.
335'	340'	Siltstone, light brown, 85%, oil shale, dark brown, 15%.
340'	345'	As above.
345'	350'	Siltstone, light gray green, 100%.

From	To	Description
930'	935'	Marlstone, light brown, varved, 70%, oil shale, dark brown, varved, calcareous, 30%.
935'	940'	As above.
940'	945'	Siltstone, gray brown, 100%.
945'	950'	As above.
950'	955'	Missing.
955'	960'	Shale, light gray, 40%, marlstone, light brown, 40%, oil shale, dark brown, 20%.
960'	965'	Marlstone, light brown, 80%, oil shale, dark brown, 20%.
965'	970'	Marlstone, light brown, 60%, oil shale, slightly varved, calcareous, 40%.
970'	975'	Marlstone, light brown, 60%, marlstone, light brown, 20%, oil shale, dark brown, 20%.
975'	980'	Oil shale, dark brown, 100%.
980'	985'	Oil shale, dark brown, 100%.
985'	990'	Oil shale, dark brown, 100%.
990'	995'	Oil shale, 60%, marlstone, light brown 40%.
995'	1000'	As above.
1000'	1045'	Missing.
1045'	1050'	Oil shale, dark brown, 100%.
1050'	1055'	Oil shale, dark brown, calcareous, 100%.
1055'	1060'	Marlstone, light brown, 95%, oil shale, dark brown 5%.
1060'	1065'	Oil shale, dark brown to medium brown, 70%, marlstone, light brown, slightly varved, 30%.
1065'	1070'	Marlstone, light brown to medium brown, slightly varved, 100%.
1070'	1075'	As above.

From	To	Description
1075'	1080'	Siltstone, light gray, 50%, marlstone, light brown, slightly varved, 50%.
1080'	1085'	Siltstone, light gray, 90%, oil shale, dark brown, 10%.
1085'	1090'	As above.
1090'	1095'	Marlstone, light brown, 40%, siltstone, light green gray, 40%, oil shale, dark brown, 20%.
1095'	1100'	Siltstone, gray, 50%, marlstone, light brown, 50%.

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From	To	Description
Core #1	Core 358.0 - 413.5	Cored 55.5' Recovered 55.5' Recovery 100%
358.0'	360.3'	Oil shale, very lean, with interbedded, marlstone, varved medium brown to light green brown, light continuous streaks of claystone; light brown gray tuffaceous siltstone at 358.6'; irregularly bedded altered tuff, partially analcitized at 359.5'.
360.3'	362.55'	Siltstone, gray brown, interbedded with gray, fine grained, sandstone; this zone is fairly porous.
362.55'	367.7'	Marlstone, light brown to light green brown, interbedded with light brown and light gray siltstone, some varving exists in the marlstone; thin irregularly bedded tuffs at 366.6', 367.0' and 367.4'.
367.7'	374.45'	Oil shale, dark brown to black, calcareous, massive, with some contorted bedding; very blebby with claystone.
374.45'	379.25'	Oil shale, varved medium brown, calcareous, top of unit marked by contorted bedding around a collapse structure; the collapsed cavity once held Naholite; gilsonite and calcite now exist around the collapse breccia; blebs with analcitized tuff common.
379.25'	383.6'	Marlstone, varved light brown to medium brown with some very thin interbedded light brown siltstone and Marlstone; streaks of pyrite common; irregularly bedded tuffs at 382.2 and 383.25'
384.9'	387.0'	Marlstone, light, brown interbedded with light brown claystone, vuggy; calcite mineralization in vugs; collapse structures, load casting and injection structures common at top of unit.

Corehole Number 5

From	To	Description
387.0'	395.2'	Siltstone, light brown, interbedded with light brown varved claystone, (lean oil shale); some fractures pyritized; pyrite streaks are also common; tuff 0.15' thick at 393.45 with pyrite crystals.
395.2'	396.7'	Claystone, light brown, interbedded with brown siltstone, vuggy solution cavities with visible clay blades.
396.7	403.9	Oil shale, varved light brown to medium brown, (lean) calcareous, vuggy toward the bottom and around 400.0'
403.9'	405.6'	Oil shale, dark brown to black, dolomitic, blebby with light brown claystone, very irregular contact with overlying unit.
405.6'	413.0'	Oil shale, varved dark brown to medium brown, calcareous; blebs with anacitized tuffs common, rarer streaks of pyrite; badly broken zone at 410.6' collapse structure with gilsonite; (solution cavity) at 413.0'.
413.0'	413.5'	Marlstone, light brown, with some medium brown oil shale; unit badly broken and fractured, orientation difficult to ascertain.
Core #2	413.5' - 434.4'	Cored 20.9' Recovered 20.9' Recovery 100%
413.5'	420.0'	Oil shale, varved dark brown to medium brown, calcareous; large solution cavity with residual bladed clay at 417.1'; collapse structure with gilsonite and calcite at 418.1'.
420.0'	427.4'	Oil shale, (lean) varved light brown to medium brown, vuggy, large collapse structure and solution cavities common; gypsum, calcite and gilsonite in cavities, some cavities drusy with dog teeth calcite (fine) calcareous to slightly calcareous, parts of unit badly broken.
427.4'	434.4'	Siltstone, gray with small carbonaceous fragment interbedded with marlstone (lean oil shale); marlstone, varved light brown to medium green brown; high angle fractures along nearly entire length; top of unit is very badly broken, siltstone is slightly calcareous.

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From	To	Description
Core #3	434.4' - 455.2'	Cored 20.8' Recovered 19.70' Recovery 95%
434.4'	439.1'	Oil shale, varved dark brown to medium brown, calcareous, large bleb of tuffaceous material with gilsonite at 434.8'; contorted bedding around 434.0', due to collapse structure; gilsonite present around collapse breccia; thin bands of segregated crystals of calcite at 438.1 - 438.6' solution cavity with gilsonite at 438.8'
439.1'	440.6'	Siltstone, grayish brown, massive, calcareous.
440.6'	444.4'	Oil shale, (lean) varved dark brown to medium green brown, calcareous, badly broken zone thought to have contained large solution cavity at 443.0-444.0 three thin layers 1/4" each of vuggy calcite at 440.7', 440.8' and 440.9'.
444.4'	453.5'	Siltstone, gray, interbedded with very contorted oil shale, dark brown to green brown, siltstone has dislodged much of the shale while still in plastic state, marbeling and load casting very common, entire zone may represent on a larger scale a plastic intrusion (not hot) just plasti
453.5'	454.1'	Oil shale, varved dark brown to medium brown calcareous, solution cavities (elongate) as if along minor fractures), noted near bottom of unite.
454.1'	455.2'	Missing.
Core #4	Core 455.2' to 485.1'	Core 29.9' Recovered 29.2' Recovery 98%
455.2'	459.4'	Oil shale, varved dark brown to medium brown calcareous, large solution cavity with residual bladed clay structures (box works) at 456.5, gilsonite locally around cavity.
459.4'	465.0'	Sandstone, light gray brown, very fine grained, carbonaceous fragments abundant.
465.0'	484.0'	Oil shale, varved dark brown to medium brown, calcareous, entire uni badly leached, large solution cavities drusy.

Corehole Number 5

From	To	Description
		with calcite common; thin bands of vuggy calcite common, (appear to be collapsed solution cavities); most of unit badly broken.
484.0'	484.4'	Siltstone, dark brown, friable, very porous
484.4'	485.1'	Missing
Core #5	Core 485.1' 502.3'	Core 17.2' Recovered 13.5' Recovery 78%
485.1'	491.7'	Oil Shale, varved dark brown to medium brown, calcareous to dolomitic; unit badly leached with vugs and solution cavities, massive calcite mineralization in vuggy areas; unit blebby and irregularly bedded with tuff at 487.25 - 488.10 streaks and blebs of claystone, common in lower part of unit irregularly bedded thin brown tuffs at 490.9' and 491.1.
491.7'	498.6'	Oil shale, siltstone, sandstone, unit badly broken and fractured; fragments-2" to pea gravel size, orientation and thickness impossible to ascertain
498.6'	502.3'	Missing
Core #6	Core 502.3' 537.3'	Core 35.0' Recovered 33.7' Recovery 96%
502.3'	504.5'	Oil Shale, (lean) varved dark brown, calcareous, box works at 502.95, other solution features common.
504.5'	507.0'	Oil Shale, dark brown, this entire unit has been leached of inorganic material (nahcolite) "pumice like", very vuggy, nahcolite must have been more finely disseminated than usual.
507.0'	510.0'	Oil shale, varved dark brown, calcareous, box works at 508.6'; thin collapse breccia at 509.6'; unit badly broken.

Corehole Number 5

From	To	Description
510.0'	514.0'	Oil shale, varved dark brown to medium brown, calcareous; fine streaks and blebbs of anacitized tuff rare solution cavity (broken) at 513.0.
514.0'	515.7'	Missing
515.7'	516.6'	Oil Shale, dark brown, very badly broken, (gravel), orientation and bedding impossible to ascertain.
516.6'	520.6'	Oil shale, dark green brown, calcareous, blebby, with medium brown tuff; discontinuous streaks of dark brown to black oil shale (fine); solution cavities in zone from 519.0 to 520.4.
520.6'	536.3'	Oil Shale, (lean) varved light to medium brown, calcareous, interbedded with light brown siltstone, pyritic streaks common. interbedding is fine scale, on the order of lamina and not bands; blebs of anacitized tuff common; very thin irregular bedded partially analcitized tuffs at 525.8' 526.55', 526.7', and 528.75'.
536.3'	537.3'	Oil shale, varved dark brown, calcareous, some very minor disruptive bedding near top of unit; porcelain type texture.
Core #7 Core 537.3 555.1 Core 17.8' Recovered 13.0' Recovery 73%		
537.3'	538.0'	Oil Shale, varved dark brown, slightly calcareous, rare loop structures and fine disruptive bedding.
538.0'	542.0'	Oil shale, (lean) varved medium brown to light brown, interbedded with light brown siltstone; very thin anacitized tuffs and streaks of pyrite common; entire unit calcareous.
542.0'	543.7'	Oil shale, varved olive green to medium green brown, calcareous, occasional bleb of tuff; loop and disruptive bedding structures very common

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From	To	Description
543.7'	550.3'	Oil shale, dark brown, calcareous, conchoidal fracture more massive than finely laminated, box works zone from 544.9 to 546.2, 547.0, 548.0; core is badly broken in intervals 544.9 to 546.2 and 548.7 to 550.3
550.3'	555.1'	Missing
Core #8 Core 555.1 to 575.1 Core 20.0' Recovered 16.35' Recovery 82%		
555.1'	557.9'	Oil shale, dark brown, calcareous, porceline type texture, loop structures common, very vuggy zone from 556.8' to 557.5'; box works, with pumice type porosity very large solution cavity at 557.5'.
557.9'	561.5'	Siltstone, varved light brown to medium brown, loop and truncated structures common, interbedded with medium brown oil shale; then blebs of tuff rare.
561.5'	567.6'	Oil shale, varved dark brown, calcareous, laminated near top of unit grading to more massive porcelin type texture; unit is broken in parts.
567.6'	571.25'	Missing
571.25'	573.3'	Oil shale, varved light brown to medium brown, calcareous; thin tuff at 572.5' 45° angle fracture near top of unit, with secondary calcite mineralization, loop & truncated bedding structures common, blebs occassional.
573.3'	575.1'	Oil shale, dark brown, calcareous, porcelin type texture, bedding more massive than laminar, 45° angle fracture at 575.0'.
Core #9 Core 575.1 to 633.4' Core 58.3' Recovered 58.3' Recovery 100%		
575.1'	579.9'	Oil shale, varved dark brown to medium brown, calcareous, regularly laminated, loop structures rare, partially analcitized

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From	To	Description
		tuffs, irregularly bedded at 577.1, 577.4, 577.5, and 577.6, the tuff @ 577.1 is 1" thick, the tuff 577.6 is up to 3" thick, high angle fracture surface at 579.5 has hydrocarbon stains
579.9'	581.5'	Oil shale, varved dark brown to black, dolomitic, loop structures common near middle and bottom of unit irregular bedded thin analcitized tuff with hydrocarbon stain at 581.0.
581.5'	592.2'	Oil shale, varved medium brown to darker brown, calcareous, loop structures very common irregularly bedded; analcitized tuff at 586.6' blebby tuff with hydrocarbon stain at 587.6' and 589.45; pyritized streaks and blebs rare zone between 584-587 badly broken in core barrel.
592.2'	599.05'	Oil shale, varved medium brown to darker brown, calcareous, loop and truncated bedding structures common, thin stringer of pyritized blebs at 595.0
599.05'	602.8'	Oil shale, varved dark brown, calcareous, blebs of tuff and thin stringers of tuff common throughout unit; tuff 3" thick at 599.7; all tuffs have hydrocarbon staining.
602.8'	604.7'	Oil shale, varved medium brown to dark brown, calcareous, with the lighter varves being more calcareous than the darker one, loop and truncated bedding structures are common.
604.7'	608.2'	Oil shale, varved very dark brown, calcareous, occasional loop structures, rare blebs and very fine streaks of tuff, zone 604.7 to 605.7 was badly broken in core barrel.
608.2'	622.5'	Oil shale, varved dark brown, calcareous, blebs and stringers of tuff, analcitized

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From	To	Description
		common; large bleb, of analcitized tuff at 613.0' thin stringers of analcitized tuff 0.1/2" thick at 616.7 and 618.7'
622.5'	624.9'	Oil shale, varved medium brown, calcareous, thin laminae, has reddish tint, characteristics of fairly high kerogen content; large loop and truncation structures common.
624.9'	633.4'	Oil shale, varved dark green to medium brown, reddish tint of higher kerogen content, calcareous; irregular bedded analcitized tuffs at 625.0 and 628.5; streaks and blebs of tuff very common.
Core #10	Core 633.4' 692.7'	Core 59.3' Recovered 59.3' Recovery 100%
633.4'	636.5'	Oil shale, varved green dark brown to black, calcareous, loop bedding common; thickest tuff is about 1/8" MM, reddish resinous lustre characteristic of good shale.
636.5'	640.6'	Oil shale, varved, dark brown to medium green brown, calcareous, thin bleby stringers; occasional resinous type lustre, loop bedding common.
640.6'	641.6'	Oil shale, varved dark green brown to black, calcareous, loop bedding common, carbon plant fragments at 641.5; irregularly bedded tuff, up to 1" thick; analcitized, hydrocarbon stained at 641.0'
641.6'	692.7'	Oil shale, varved dark brown to dark green brown calcareous to slightly calcareous, thin analcitized tuffs and irregularly bedded tuffs common, darker zones of shale exist at 654.2', 655.5' 661.8' 663.0', 668.6' 670.0', 675.2' 677.3' 689.6' and 691.0'; Tuffs between 684.0' 687.0' are hydrocarbon stained, 1 1/2" tuff at 685.5'

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From	To	Description
Core #11 Core 692.7'	751.9'	Core 59.2 Recovered 59.2' Recovery 100%
692.7'	693.5'	Oil shale, varved dark gray to medium reddish brown, slightly calcareous to dolomitic.
693.5'	695.3'	Siltstone, light brown slightly varved at 695.2, tuff irregular bedded, with some white clay alteration.
695.3'	704.9'	Oil shale, varved medium brown to dark brown slightly calcareous to calcareous, irregularly bedded, analcitized tuffs, 1" thick at 700.05, 701.6', 702.0' 702.3' 702.5' 702.8' very thin streaks and blebs of tuff common.
704.9'	705.3'	Tuff, reddish brown, hydrocarbon stained.
705.3'	731.15'	Oil shale, varved medium brown to dark brown, slightly calcareous to calcareous, occasional disruptive bedding; zone between 709.1' and 710.1' exhibits load cast structure of analcitized tuff; actual bed of tuff at 709.9 to 710.1' thin irregular bedded tuffs at 711.3' 714.3' 716.3' 718.4' 720.5' 724.0' 727.6'. 729.4' and 730.25; streaks of pyrite common.
731.15'	731.4'	Siltstone, light brown slightly varved thin tuffs on either end.
731.4'	740.0'	Oil shale, varved dark brown, to medium brown, calcareous, looped and truncated bedding structures near bottom of unit, irregularly bedded tuff at 738.9'.
740.0'	742.6'	Tuff, blue gray to salmon pink, partially analcitized, (blue) ; distructively interbedded with irregularly bedded oil shale, brown to darker brown wavy bedded tuff.

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From	To	Description
742.6'	751.9'	Oil shale, varved brown to dark brown calcareous, upper part of unit has distinctively varved but grading to more highly varved lower part of unit, lower part of unit demonstrative loop bedding where as upper part of unit shows more truncated bedding, thin blebs and streaks of tuff common
Geolograph 809.° should be 809.3		
Core #12	751.9' 809.2'	Core 57.3 Recovered 57.37 Recovery 100%
751.9'	754.'	Oil shale, dark brown to light brown, slightly varved considerable amount of dark shale in interval of 751.9-753.0 irregularly bedded discontinuously bedded tuffs with some unalcitization evident 1-1/2 x 1/2 in. bleb of tuff at 752.4 (calcareous)
754.'	758.8'	Oil shale, dark brown to brown massive to finely varved. Some blebs of anacitized tuff in the interal. (calcareous)
758.8'	761.6'	Oil shale, dark brown to brown varved with interbedded siltstone, gray all beds of siltstone 1/2"
761.6'	762.6'	Oil shale, dark brown to brown with interbedded gray siltstones predominantly non-calcareous
762.6'	765.1'	Oil shale, dark brown to brown varved with minor amounts of discontinuously bedded tuffs at 763.4' & 764.2' calcareous
765.1'	767.8'	Oil shale, brown to dark brown varved interbedded with siltstone gray with minor inclusions of altered tuff cal-careous
767.8'	769.2'	Oil shale brown to dark brown interbedded with oil shales and dark gray calcareous

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From	To	Description
769.2'	777.4'	Oil shale varved, brown to light brown varved, with interbedded gray siltstones; banded with dark brown to black oil shale in interval 774.1 to 774.8'
777.4'	778.1'	Oil shale, varved brown to dark brown, varved with interbedded shale dark gray. Some tuffs 1/8" showing microstructure calcareous.
778.1'	779.4'	Oil shale, varved brown to brown with interbedded siltstone from 778.9 to 779.0'
779.4'	778.6'	Siltstone, gray, with interbedded brown oil shale, 1/2" thick; contains some pyritic blebs; oil shale on interval from 782.8 to 783.2 at 783.8 a 1-1/2" bed of tuff with secondary crystallization of calcite and dolomite in vugs in interval from 784.8 to 788.6 all siltstone (noncalcareous).
778.6'	790.7'	Oil shale, varved dark brown to light brown varved with brown wavy bedded tuff 1/2" at 789.6' some blebs of altered tuff pyritization.
790.7'	791.8'	Oil shale, brown to dark brown dolomitic with considerable amounts of dark gray shale non-calcareous.
791.8'	795.4'	Oil shale, varved dark brown to brown, with brown irregularly bedded tuff at 792.7, some dark gray to blue gray blebs of tuff scattered in interval. Lower part contains some thin beds of gray siltstone 1/2" blebs of dark brown tuff (containing hydrocarbons) at 794.6' 795.1 small beads of heavy hydrocarbons from on exposure to sun some small 1/2" wavy bedded unaltered tuffs in interval 795 to 795.4 noncalcareous.
795.4'	795.8'	Tuff, light to dark brown heavily saturated with hydrocarbons.

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From	To	Description
795.8'	796.3'	Oil shale varved, dark brown to light brown, dolomitic brown tuff, 1/2" thick at 796.2'
796.3'	796.5'	Tuff, brown to black saturated with hydrocarbons bleeds heavily on exposure to sun. Regular bedding plane on bottom irregularly bedded on top slight inclusion of oil shale.
796.5'	807.8'	Oil shale, varved light brown to dark brown calcareous; blebs of tuff, 1/2" thick at 797.0', saturated with hydrocarbon; occasional tuff, 1/4" thick or less in the interval; interbedded black oil shales give banded appearance on interval from 799.1' to 800.6'; 2 beds of tuff, at 800.05' and 800.15', both 1/4" thick and saturated with hydrocarbons; at 800.8 tuff, white to light blue, analcitized, with trace of hydrocarbon.
807.8'	808.3'	Tuff, light blue to black, irregularly bedded, contains inclusions of oil shale, saturated with heavy hydrocarbons..
808.3'	809.2'	Oil shale, varved dark brown to brown, calcareous.
Core #13 809.2'	868.1'	Cored 58.9' Recovered 58.9' Recovery 100%
809.2'	810.9'	Oil shale, varved brown to dark brown, calcareous with minor siltstones 1/4" thick in lower part; at 810.6 nahcolite, irregularly bedded veinlet 3/4" thick vuggy.

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From	To	Description
810.9'	812.1'	Oil shale, varved brown to dark brown dolomitic with interbedded dark oil shales forming banding.
812.1'	815.5'	Oil shale, varved brown to dark brown, with interbedded siltstones 1/2" thick at 813.7' 813.9', and 814.3' at 815.0, approximately 2" thick banding of dark oil shale.
815.5'	817.2'	Oil shale varved, brown to dark brown, dolomitic, with interbedded very dark brown to black shales forming dark band; at 815.5, tuff, irregularly bedded saturated with hydrocarbons, at 816.7, tuff 1/2 " thick irregularly bedded with some hydrocarbon saturation.
817.2'	828.4'	Oil shale, varved brown to dark brown, dolomitic, with interbedded dark gray shales giving banded appearance throughout interval; a few minor siltstones 1/2" thick locally heavy banding due to increase in black oil shale content; at 824.7, tuff, 3/4" thick, brown, some trace of hydrocarbon saturation.
828.4'	831.1'	Oil shale, varved brown to dark brown, calcareous dark shale banding 1 - 1/2 " at 830.7'.
831.1'	835.2'	Oil shale, varved brown to dark brown with interbedded black oil shales at 832.9' tuff, 1 1/2" thick brown to dark brown irregularly bedded contains some hydrocarbons.
835.2'	836.6'	Oil shale, varved brown to dark brown dolomitic with some interbedded black oil shales.
836.6'	837.7'	Oil shale, varved brown to dark brown, dolomitic with interbedded black oil shales.

Corehole Number 5

From	To	Description
837.7'	840.9'	Oil shale, varved light brown to brown with minor amounts of black oil shale, forming banding at 839.5' 840.3 and 840.7.
840.9'	842.0'	Nahcolite, dark brown to clear, coarsely crystalline to medium crystalline with minor amounts of oil shale inclusions; surfaces on adjacent oil shale show residual bladed clay structure.
842.0'	842.6'	Oil shale, considerable distorted bedding around vugs; tuff, 1/2" thick exhibiting hydrocarbon saturation; vugs 1/2" x 1/2" exhibits residual clay structure.
842.6'	846.2'	Oil shale, varved brown to dark brown, calcareous varved with interbedded siltstones, 3/4" thick on interval 843.2 to 845; at 844.3, tuff 1/2 " thick, thin 1/4" gray anacitized.
846.2'	847.5'	Oil shale, varved brown to dark brown, calcareous with minor amounts of black oil shale.
847.5'	857.1'	Oil shale, varved light brown to dark brown calcareous with occasional dark banding due to black oil shale, minor beds of siltstone 2" thick on interval 855.5 to 856.2'
857.1'	861.6'	Marlstone, brown, calcareous; interbedded with oil shale and siltstone, at 857.6' tuff 1" thick gray to blue gray, anacilited.
861.6'	864.9'	Oil shale, varved dark brown to brown calcareous with some dark banding due to black oil shale on interval 862.9 863.7 siltstones gray 1" thick tuff dark gray to black irregularly bedded at 863.4 3" vuggy.
864.9'	866.2'	Oil shale varved dark brown to brown, dolomitic with black oil shales, irregularly bedded from 864.9' to 865.3' to 864.6' tuff, 2 1/2" thick, brown, minor blebs of tuff

Corehole Number 5

From	To	Description
		brown, scattered throughout interval.
866.2'	868.1'	Oil shale, brown to dark brown, calcareous interbedded throughout siltstones 3/4" thick throughout bleb of pyrite tuff at 867.7'
Core #14 868.1' 927.0' Cored 58.9' Recovered 58.9' Recovery 100%		
Geolograph Records 927.0		
868.1'	869.0'	Oil shale, varved dark brown to light brown calcareous looped and truncated bedding, tuff at 868.2, gray analcitized.
869.0'	869.85'	Oil shale, varved dark brown to black, calcareous to dolomitic. Reddish brown reson luster; lower part of unit very bleby
869.85'	871.4'	Oil shale, varved dark brown to light brown, calcareous, looped structure.
871.4'	874.1'	Oil shale with interbedded siltstone, light brown, slightly varved, slightly calcareous, bottom of unit more dirt.
874.1'	874.4'	<i>Curly?</i> Tuff, gray to brown, analcitized hydrocarbon staining, very irregular top and bottom contacts.
874.4'	881.1'	Oil shale, varved light to medium dark brown, irregular bedded tuffs at 874.4, 875.7', 876.1' 876.6', 877.7' and 879.4 thin streaks and blebs of tuff, oil shale exhibits looped and truncated bedding; vertical fracture with secondary pyrite, and calcite at 879.5' to 880.1'
881.1'	886.0'	Oil shale, medium to dark brown, calcareous, with dark brown to gray siltstone streaks and blebs of pyritized material, oil shale exhibits disruptive bedding.

Corehole Number 5

From	To	Description
886.0'	911.6'	Siltstone, light gray to brown with thin bands of oil shale at 888.4 and 890.8' <u>vuggy zones</u> out from 902.4 to 903.0, 904.0 to 904.8, 907.5 and 909.0 to 910.7; crystals of pyrite and calcite in vuggy zones 907.5 to 909.0.
911.6'	922.5'	Oil shale interbedded with thin siltstone; oil shale varved light to medium brown, calcareous, blebby with truncated bedding at top of unit; 2 zones of unit showing red resionous luster ate 911.6 - 913.4 and 915.8 to 917.2; both units have looped and truncated bedding; at 918.0 to 920.1 and 918.6, tuffs, 2" thick steel gray to brown, analcitized irregularly bedded.
922.5'	926.75'	Oil shale, varved gray to light brown clacareous, with interbedded siltstone, gray; at 923.6, tuff 2" thick, analcitized and pyritized; at 925.9' bleb of analcitized tuff; streaks of altered tuff common.
Core #15	927.0' to 985.7'	Cored 58.7 Recovered 58.7 Recovery 100%
927.0'	928.4'	Oil shale, varved brown to light brown calcareous, interbedded gray siltstone; light gray to medium gray marlstone.
928.4'	930.1'	Oil shale, brown to dark brown, massive, dolomitic, with red brown luster; at 928.6' bleb of gray to brown claystone; at 929.6', stringer of analcitized tuff 1/8" thick.
930.1'	930.4'	Tuff, dark gray to dark bluish gray, analcitized irregularly bedded upper contact.
930.4'	932.1'	Oil shale, varved light brown to brown dolomitic with interbedded gray claystones and light gray siltstones 1/2" thick at 931.1, 931.3, 931.4 and 932.1'.

Corehole Number 5

From	To	Description
932.1'	936.2'	Oil shale, varved brown to dark brown dolomitic to calcareous, with interbedded siltstones gray 1/8" thick from 933.6 to 935.4; at 935.5, tuff 3" thick, gray analcitized.
936.2'	936.45'	Tuff, gray to dark gray analcitized, bedded.
936.45'	939.6'	Marlstone, gray to light brown, dolomitic interbedded gray siltstone; contains some light brown to dark brown varved oil shale in lower 1/2".
939.6'	940.4'	Tuff, gray to brown, with disrupted inclusions of light brown to dark brown varved oil shale; brownish color due to hydrocarbon staining; partially analcitized.
940.4'	941.0'	Oil shale, varved brown to dark brown dolomitic.
941.0'	940.5'	Oil shale, varved light brown to brown, calcareous, with looped and truncated bedding.
940.5'	943.0'	Oil shale, varved brown to dark brown, calcareous, with looped and truncated bedding at 942.8' blue analcitized tuff 1/2" thick with irregular bedding on lower contact.
943.0'	952.0'	Oil shale, varved light brown to dark brown, with some interbedded gray siltstones throughout interval; oil shale, dolomitic predominant on interval 944.6' to 947.0'; at 944.0, tuff 1/2" thick, analcitized; at 944.7', tuff, 1" thick, irregularly bedded; looped and truncated bedding common in the oil shale.
952.0'	955.6'	Siltstone, gray with minor amounts of interbedded oil shale, varved brown, dolomitic and light gray claystone.
955.6'	957.6'	Oil shale and claystone gray to light brown; 1" band of light to dark brown varved oil shale at 956.7'.

Corehole Number 5

From	To	Description
957.6'	961.6'	Oil shale, and siltstone from 957.6 - 958.7 oil shale varved dark brown to light brown, calcareous, looped and truncated bedding; 958.7' - 961.6', siltstone, gray with interbedded brown to dark brown varved oil shale; oil shale, calcareous dominant on interval 961.0' - 961.6'.
961.6'	963.5'	Interbedded gray siltstone and brown oil shale, oil shale lean dolomitic.
963.5'	978.2'	Marlstone, gray to dark gray, with interbedded claystone and siltstone; blebs and stringers of tuff throughout; tuff shale sequence from 966.9 to 969.5; tuff is pinkish irregularly bedded; occasional small beds of anacilitized tuff 1/2" thick truncated and looped bedding occasional throughout.
978.2'	983.0'	Oil shale, varved dark brown to brown, calcareous truncated and looped bedding common; occasional blebs of tuff.
983.0'	985.7'	Marlstone, light gray to dark gray, calcareous; occasional tuff beds 1/8" thick.
Core #16	985.7' - 1045.1	Cored 60.05' Recovered 60.05 Recovery 100%
985.7'	992.9'	Marlstone, gray to light gray calcareous with interbedded gray siltstone; heavy vertical fracturing along entire interval; at 987.7 thin bed of blue anacitized tuff 1/8" thick.
992.9'	995.2'	Oil shale, brown to dark brown, dolomitic, exhibits chequing, indicative of higher illite content; lower 6" becoming silty.
995.2'	1007.7'	Marlstone varved light gray to gary, calcareous with interbedded gray claystones, light gray siltstone and light gray, very fine grained, sandstone.
1007.7'	1015'	Oil shale, light brown to brown, interbedded with gray siltstone in interval; small tuffaceous beds scattered in interval; blebs of altered tuff occasional.

Corehole Number 5

From	To	Description
1015.5'	1022.1'	Siltstone, gray to very light brown, interbedded with marlstone, gray to brown, calcareous with disrupted bedding; at 1022, tuff, gray to brown analcitized and hydrocarbon stained.
1022.1'	1023.3'	Oil shale, dark brown, bleby exhibit chequing near bottom of unit.
1023.3'	1026.8'	Oil shale, varved light brown to brown, slightly calcareous, at 1024.0, tuff, 1/2" thick, analcitized.
1026.8'	1037.1'	Siltstone, light gray, with interbedded gray claystone and light brown (lean) oil shale, entire unit calcareous.
1037.1'	1045.7'	Oil shale, varved gray brown to brown, some varves give way to massive bedding, interbedded with gray claystone and siltstones; irregularly bedded tuffs and blebs rare; tuffs, 1" in thickness at 1043.4' and 1045.3'; unit calcareous, some chequing.

End of Core